

Space Weather Forecast

Issued on Friday, 27 May 2022 at 13:09 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales <https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales>

Space Weather Forecast Headline: Risk of radio blackouts now declining. Risk minor to moderate geomagnetic storm intervals into start of UTC weekend.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been low over the past 24 hours, with occasional low-level common-class X-ray flares observed.

There are currently five sunspot regions on the Earth-facing side of the sun, with the previous largest and nominally most complex spot now having crossed to the far side. In addition, a second small spot faded away in the past 24 hours. Meanwhile, the most significant remaining spot group in terms of magnetic classification and history was noteworthy in the period for a significant apparent decline, with its trailing group disappearing entirely, although this may be in part due to the narrowing viewing angle. All other regions on the sun were small and magnetically simple, with no significant flares observed.

A possible (pair of) disappearing filament(s) (arcs of plasma possibly leaving the sun) were observed on ground-based infra red telescope imagery around 27/0600-0800UTC from the southeastern quarter of the sun, although there was no evidence of any ejecta on coronagraphs at the time of writing. A Coronal Mass Ejection (CME) seen heading apparently westward overnight UTC has yet to be modelled, however for now, no new CMEs are considered to be en route.

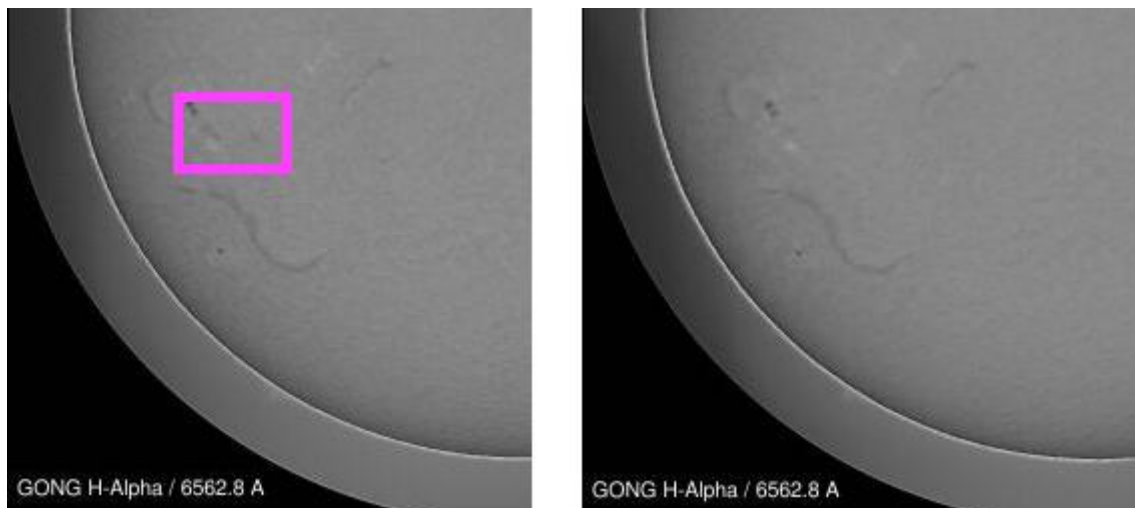


Figure 1: Ground-based observatory imagery of a possible (pair?) of ‘disappearing filaments’. There is not currently any evidence of any ejecta on available satellite imagery.

Solar Wind / Geomagnetic Activity: The solar wind showed an enhanced pattern of behaviour

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in the past 24 hours in some measures, with the number of particles forming the wind rising above background with time. This rise was also shown at another satellite, albeit to a lesser degree. The cause of this is not definitive, however it may be a precursor to the expected imminent entry into a fast wind (from one of a pair of 'coronal holes'), else the leading edge of any CME enhancement from the moderate-class flare-linked CME emitted on 25 May. On balance, the more likely explanation is the former.

The solar wind was otherwise slow, with the speed mainly declining before a late slight recovery. The magnetic field associated with particles in the wind was erratic in magnitude over the period, peaking at the very end with a possible entry into the anticipated fast wind - to be confirmed with more data into the UTC afternoon.

The net effect of the above solar wind measures was nevertheless provisionally entirely Quiet over the 24 hours, most likely because of the slow speeds involved.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is now expected to be mainly low, with the recent largest spot now having left the facing side and with its apparent successor in decline. The daily risk of moderate-class flares is now assessed as slight and decreasing. There are no obvious arriving regions over the eastern solar horizon at present, and any increase in activity would therefore probably need to arise from development of the current quiet front side.

Solar Wind / Geomagnetic Activity: One CME features in the current forecast, that emitted on 25 May from the moderate-class flare from a now-faded sunspot. This may be concurrent with the forecast fast wind from one of a pair of coronal holes, combining to give a peak risk of Minor Geomagnetic Storm G1 on Saturday 28 May, perhaps Moderate G2 should the phasing of the CME and fast wind combine, with a chance of arriving during the remainder of Friday 27 May.

Conditions should become less disturbed later in the UTC weekend and on into the new working week, with Monday probably seeing the most reliably quiet conditions.

Energetic Particles / Solar Radiation: Solar radiation storms should become less likely with time from now, with the recent daily slight chance now judged to be in decline as the most potent spots rotate past their peak positions for affecting Earth should they flare into the UTC weekend.

Geomagnetic Storms:

Geo-Magnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	No	40	60	10	1
Strong	G3	No	1	5	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 M Class	No	20	20	5	5
Very Active	R3 to R5 X	No	5	5	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms	Level (cm ⁻² sr ⁻¹ s ⁻¹)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	10	5	2	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = cm⁻²sr⁻¹s⁻¹)